

Appl. No. : 10/558,843
Filed : November 29, 2005

AMENDMENTS TO THE CLAIMS

Please cancel Claims 1-6, without prejudice.

Please amend Claims 7 and 9-13, and add Claims 14 and 15 as follows.

1-6. (Cancelled)

7. (Currently amended) A method for preparing a synthesissynthetic gas from methane and an oxygen containing compound using an atmospheric pressure barrier discharge reaction, the method comprising:

a first step of filling a catalyst in a reactor ~~e~~onsisting of having a quartz tube 5 constituting a body of the reactor and serving as a dielectric at the same time, and heating the methane reforming catalyst layer 8 with a heating member 9;

a second step of mixing the methane and the oxygen containing compound when a temperature is maintained to be 200~400 °C through the first stepfilling and then introducing the mixture into the reactor via an inlet tube 1;

a third step of applying, simultaneously with the mixing, a high voltage to an internal electrode 3 of the reactor and an external electrode 4 ~~e~~onsisting of having a metal thin film ~~e~~of the reactor using a power supply 6 simultaneously with the second step to generate plasma in the reactor ~~e~~onsisting of the quartz tube 5, thereby preparingproducing a synthesissynthetic gas; and

a fourth step of discharging the synthesissynthetic gas obtained in the third step to an exterior via an outlet 2 of the reactor.

8. (Original) The method according to claim 7, wherein the oxygen containing compound is one selected from a group consisting of carbon dioxide, water and air.

9. (Currently amended) The method according to claim 7, wherein the catalyst ~~i~~n the first step is a methane reforming catalyst and is one selected from a group consisting of nickel catalyst, noble metal catalyst, alkali metal catalyst and alkali earth metal catalyst.

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10. (Currently amended) The method according to claim 7-~~or~~9, wherein the catalyst is nickel catalyst.

11. (Currently amended) The method according to claim 7, wherein a temperature of the heating member 9-is maintained to be 200~400 °C.

12. (Currently amended) The method according to claim 7, wherein the methane and the oxygen containing compound introduced in the second step~~mixing~~ react while passing through a region 7a-in which the plasma only exists among an area 7-in which the plasma is generated in the reactor in the third step~~applying~~, and complete the reaction while passing through a successive region 7b-in which the plasma and the catalyst are mixed.

13. (Currently amended) The method according to claim 7, wherein the external electrode 4 is made of a metal coated to be thin on the quartz tube 5-with a thickness of 0.5 mm or less.

14. (New) The method according to claim 7, wherein the method is carried out by using an apparatus for preparing a synthetic gas from methane and an oxygen containing compound using an atmospheric pressure barrier discharge reaction, the apparatus comprising:

an inlet tube mixing and introducing the methane and the oxygen containing compound into a reactor;

an internal electrode of the reactor;

an external electrode made of a metal thin film of the reactor;

a quartz tube constituting a body of the reactor and serving as a dielectric;

a methane reforming catalyst layer filled in the atmospheric pressure barrier discharge reactor having the quartz tube so as to induce a catalyst reaction;

a heating member mounted to heat the catalyst layer only;

a power supply supplying currents to the internal and external electrodes to generate plasma;

electric wires in which currents flow;

a current-grounded part; and

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an outlet for discharging a product (synthetic gas) prepared as a reaction is completed into an exterior.

15. (New) The method according to claim 9, wherein the catalyst is nickel catalyst.